

Cavernous Artery Stenosis Detected By Penile Doppler Ultrasonography As A Predictor Of Coronary Artery Disease: A Case Report

KORONER ARTER HASTALIĞININ BELİRLEYİCİSİ OLARAK PENİL DOPPLER ULTRASONOGRAFI İLE SAPTANAN KAVERNOZ ARTER STENOZU: OLGU SUNUMU

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SUMMARY

An association between Coronary Artery Disease (CAD) and Erectile Dysfunction (ED) has been described. We aimed to show that cavernous artery stenosis may be an important predictor of a silent but serious CAD. A 56-year-old man who had moderate ED was evaluated for risk factors. He had several vascular risk factors for ED and CAD including age, smoking, hypertension, hyperhomocysteinemia and hyperlipidemia. His penile colour Doppler ultrasonography revealed multiple stenotic area in the right cavernous artery. His treadmill exercise test showed significant changes. Then, coronary angiography was performed and it showed the patient had double-vessel CAD. Findings of atherosclerotic plaques in cavernosal arteries with penile Doppler ultrasonography may be address subclinical coronary artery stenosis in patients with ED.

Keywords: Erectile dysfunction, coronary artery disease, doppler ultrasonography

ÖZET

Koroner arter hastalığı ile erektil disfonksiyon arasındaki ilişki belirgindir. Bu yazıda kavernozaal arter darlığının sessiz fakat ciddi koroner arter hastalığını gösterebileceğinin ortaya konulması amaçlandı. Orta şiddette erektil disfonksiyon yakınması olan 56 yaşındaki hasta risk faktörleri açısından değerlendirildi. Hastanın yaş, sigara, hipertansiyon, hiperhomosisteinemi ve hiperlipidemi olmak üzere çok sayıda vasküler risk faktörü vardı. Penil Doppler ultrasonografide sağ kavernozaal arterde çok sayıda darlık saptandı. Treadmill egzersiz testinde belirgin değişiklikleri olan hastanın yapılan koroner anjiyografisinde iki damarda stenoz saptandı. Eretil disfonksiyonlu hastalarda penil Doppler ultrasonografi ile kavernozaal arterlerde saptanan aterosklerotik plaklar subklinik koroner arter hastalığı habercisi olabilir.

Anahtar sözcükler: Eretil disfonksiyon, koroner arter hastalığı, doppler ultrasonografi

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Erectile Dysfunction (ED) is a common medical disorder that has negative impact on the quality of life of millions of men worldwide. In the Massachusetts Male Aging Study (1), ED has been found to some degree in 52% of adult men between the ages of 40 and 70 years. Common risk factors for atherosclerosis are frequently found in patients with ED, and the severity of ED is related to the number and severity of risk factors (1,2). A high prevalence of ED has been reported in conjunction with other vascular abnormalities, including Coronary Artery Disease (CAD) (3,4). Erectile dysfunction and CAD may be the two different aspects of the same disease. Although there are several other causes underlying ED, it is generally accepted that it is the clinical end point of a penile vascular dysfunction. That is why patients suffering from ED with demonstrated atherosclerotic plaques on penile Doppler ultrasonography should be evaluated for silent sclerotic coronary arteries. In this article we report a male patient with multiple cavernosal atherosclerotic plaques who later turned out to harbor a silent but serious CAD.

CASE REPORT

A 56-year-old man was admitted to our outpatient clinic with complaints of ED for more than 2 years. His libido was normal and did not have any symptoms of a late onset of hypogonadism. He was on antihypertensive medication with angiotensin converting enzyme inhibitors for 4 years and he also had an untreated hyperlipidemia. Although the patient had additional risk factors for ED including smoking and hyperhomocysteinemia, a detailed

history did not reveal any cardiac symptoms. Table shows the possible risk factors for ED and CAD observed in the patient. Sexual function was assessed with the International Index of Erectile Function, a validated 15-item self-administered questionnaire. The patient's score was 16 out of 30, indicating a moderate ED. The patient was evaluated by penile Doppler ultrasonography that revealed multiple stenotic areas in the right cavernous artery (Figure 1).

An exercise test was conducted which revealed ST-segment depression. Coronary angiography was then performed and showed evidence of a double-vessel disease (Figure 2). The patient underwent percutaneous transluminal coronary angioplasty with stenting, and satisfactory flow in the right coronary artery was restored.

Table. Demographics and laboratory findings of the patient

Age	52 years
BMI	27 kg/m ²
Smoking	40 packet/years
TA	150/90 mmHg
Fasting blood glucose (FBG)	96 mg/dl
Postprandial blood glucose (PBG)	100 mg/dl
Total cholesterol	242 mg/dl
Total triglycerid	247 mg/dl
LDL	159 mg/dl
HDL	40 mg/dl
Homocysteine	23,83 μmol/ml
APO-A	160 mg/dl
APO-B 100	140 mg/dl

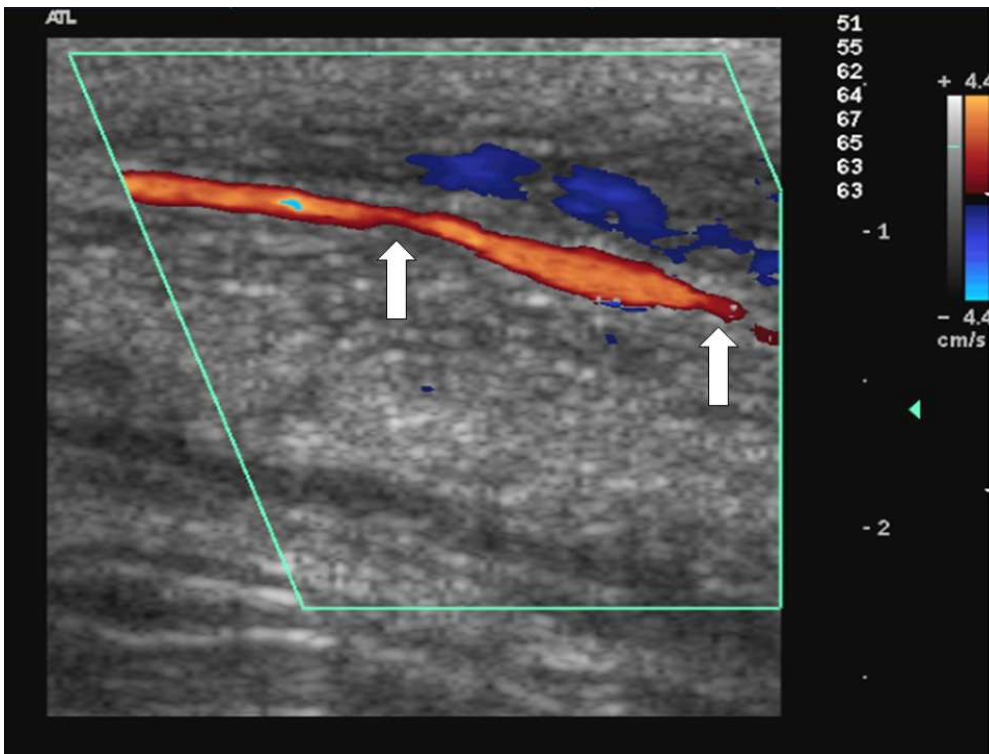


Figure 1. Color Doppler image of right cavernous artery showing multiple stenosis (arrows)

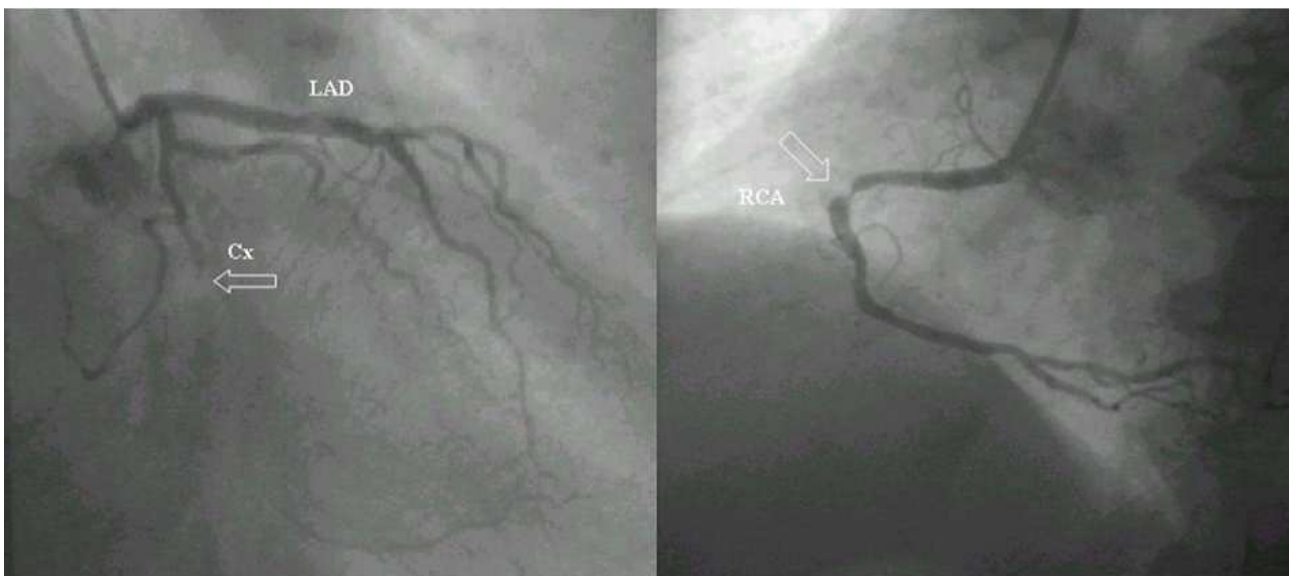


Figure 2. Coronary artery angiograms. White arrows point to critical stenosis. LAD = left anterior descending artery, Cx = circumflex artery; RCA = right coronary artery

DISCUSSION

Until the 1980s, the etiology of ED was thought to be primarily psychogenic. However, with improvement in investigation techniques, organic contributions to etiology are now documented in up to 80% of men with ED. The penis is a specialized vascular bed and not surprisingly ED often has a vasculogenic origin. ED is known to be more frequent in patients with cardiovascular diseases. Epidemiological studies have clearly demonstrated that ED and CAD have the same principal risk factors, namely aging, hypertension, diabetes, smoking and hyperlipidemia [3]. The majority of patients with ED are known to have at least one significant cardiovascular risk factor [3, 5]. It has also been demonstrated that ED is more common and severe in patients with metabolic syndrome which is also defined as a multidimensional risk factor for cardiovascular disease [2]. The cavernous arteries are similar to the coronary arteries mainly in that they are end arteries without collateral circulation. Therefore, vasculogenic ED may be a result of a systemic vasculopathic state, similar to CAD.

Our case had multiple traditional and novel vascular risk factors for ED including; age, hypertension, hyperlipidemia, smoking and hyperhomocysteinemia. According to the second Princeton Consensus Conference Guidelines [6], our patient falls in the Intermediate Risk Factor Group, this included ≥ 3 major risk factors (age, gender, hyperlipidemia, hypertension and smoking) for CAD. The recommendation is that these patients should undergo specialized cardiovascular testing (such as exercise stress test, echocardiography) and then be re-stratified into high risk or low risk based on the results of cardiovascular assessment.

A growing body of literature has now identified ED as a marker for silent CAD with an average lead time of 2 to 5 years between ED and CAD [4]. Montorsi et al. [7] recently proposed a pathophysiological mechanism called the "artery size" hypothesis to explain the link between ED and CAD. Given the systemic nature of atherosclerosis, symptoms at different points in the system rarely become evident at the same time. This is likely the result of larger vessels being able to better tolerate the same amount of

plaque as compared to the smaller ones. Thus, when atherosclerosis significantly affects the coronary circulation, the penile arteries are usually damaged.

Our case supports the hypothesis of ED as an early marker of vascular disease. Several studies addressed the connection between ED and CAD. A 20% prevalence of positive exercise stress test has been found in ED patients; however, if or when patients with isolated ED will ultimately develop CAD is actually not known.

CONCLUSION

Penile artery is an end artery and smaller than coronary artery. Therefore, generalized atherosclerosis is expected to affect the penile artery long before the coronary arteries. As in our case, findings of atherosclerotic plaques in cavernosal arteries with Doppler USG may address a subclinical coronary artery stenosis. Larger studies are required to determine the association between cavernosal stenosis on Doppler ultrasonography and silent significant coronary artery stenosis.

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